

Used Ethnobotany of medicinal plants by inhabitants of Al-Mafraq, Jordan

Uso Etnobotánico de las plantas medicinales por los habitantes de Al-Mafraq, Jordania

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Abstract

All medicinal plants showed the therapeutic effects as analgesic/stimulant by the inhabitants of Al-Mafraq in the northern parts of Jordan during March 2011 to May 2013 were recorded and listed with full information. A total of 42 plant species belonging to 22 families are identified which are being used by the people of the study area. Data collected absolutely as the outcome of the methodology relied predominantly on qualitative tools such as informal meetings with the local people, open discussions and observation, which enabled the presentation of accurate account of knowledge routed via oral sources. The medicinal plants investigated are divided into eight main categories relative to their own mechanism of effect. The present study provides baseline data on internal therapeutic properties of native medicinal wild plants that can be more protected from over exploitation from one side, and further investigated by pharmaceutical industry for screening new active compounds from another side.

Key words: Ethnobotany, medicinal plants, uses, Al-Mafraq, Jordan.

Resumen

Todas las plantas medicinales mostraron efectos terapéuticos como analgésicos / estimulantes en los habitantes de Al-Mafraq, en la región norte de Jordania, durante el periodo de marzo 2011 a mayo 2013, según se registra con información detallada. Un total de 42 especies de plantas pertenecientes a 22 familias han sido identificadas, las cuales son de uso de los pobladores del área de estudio. Los datos han sido colectados mediante una metodología basada predominantemente en herramientas cualitativas, tales como reuniones informales con los pobladores locales, discusiones abiertas y observación, lo cual permite la presentación de un registro preciso de conocimientos provenientes de fuentes orales. Las plantas medicinales investigadas se dividen en 8 categorías principales de acuerdo a sus mecanismos de efecto. El presente estudio brinda una línea base de datos sobre las propiedades terapéuticas internas de las plantas silvestres medicinales nativas que pueden ser mejor protegidas de la sobreexplotación, por un lado, e investigadas con mayor profundidad por la industria farmacéutica para detectar nuevos componentes activos, por otro lado.

Palabras clave: Etnobotánica, plantas medicinales, usos, Al-Mafraq, Jordania.

Introduction

Jordan territories are located in the center of the middle east between longitudes 35° 40' and 39° E and between latitudes 29° 30' and 34° N with total area estimated in approximately of 90 thousands of square kilometers, extending in the transition region the middle east countries, Syria and Lebanon from north, Iraq and Saudi Arabia from east, Egypt and Saudi arabia from the south and Palestine from the west. Jordan generally exhibited the climate of desert or semi-desert with an arid climate, with few large natural wetlands, (Al-Eisawi, 1982, 2012; Al-Eisawi *et al.*, 1998; Friedman *et al.*, 1986; Al-Quran, 2009; Zohary, 1973; Zohary & Feinbrun-Dothan ,1962-1988).

This topographical diversity of Jordan, which creates varied ecological conditions within a limited area contributes to this wealth of plant diversity especially at the level of plant genera and species, so Jordan is of great interest because it is the meeting place of the Mediterranean, Irano-turanian, Saharo-arabian regions and the Nubo-sudanian regions. Because Jordan is situated at the junction of these different phytogeographical regions, the Irano-turanian, Afro-subtropical and Mediterranean, it acts as a floral bridge between the continents of Asia, Africa and Europe, so the flora includes a mixture of these elements together extending from: *Juniperus phoenicia*, *Cupressus sempervirens*, *Pinus halepensis*, *Quercus calliprinos* to *Ziziphus spina-christi*

(Friedman *et al.*, 1986; Heinrich, 2000; 2002; Karim & Al-Quran, 1988; Al-Eisawi, 1982; Al-Quran, 2005; 2007; Zohary, 1973).

Indigenous remedies now days occupying a good position since it is safe and inexpensive, which gives it popularity among both rural and urban areas. So the information about ethnic groups or indigenous traditional medicine has played a vital role in the discovery of active constituents from medicinal plants.

The study area is located within Al-Mafraq territories at an elevation of 600 m above sea level. This area is dominated by Mediterranean and semi arid habitat since it is influenced by the westerly fronts' currents associated with winter precipitation and the easterly desert climate, so the cold winter is the general climate. The mean annual precipitation is of 350 mm in winter while the spring months tend to be wetter with average precipitation not exceeding 200 mm. The mean summer temperature is 30 °C while 6-15 °C is the average winter temperature (Al-Genidi, 1992; Lemon *et al.*, 2003; Jones & Clarke, 1990).

The main aim of the present study was to document the indigenous therapeutic uses of the investigated medicinal plants used as internal therapeutic effects by the local people living in this area for which no literature is still available concentrating on this special issue.

Material and methods

The researcher methodology relied predominantly on qualitative tools such as informal meetings with the local people, open discussions and observation, which enabled the presentation of accurate account of knowledge routed via oral sources (Al-Quran, 2009). The study area is located within Al-Mafraq region which

is dominated by Mediterranean habitat from one side, and the semi arid habitat from other side, so the cold winter and the semi arid summer is the general climate. The vegetation cover is mainly of saharo-arabian type dominated by desert plants like *Anabasis articulata*, *Artemisia herba alba*, *Noea mucronata*, *Chenopodium* species, *Salsola* species, *Sueda* species and *Zilla spinosa*

All collected specimens of wild medicinal plants that classified and identified were constructed in form of table containing the relevant information. The survey was unique and conducted during the period from march 2011 to may 2013 from four sites of the study area depending on collection of voucher specimens, identifying and classifying of these edible plant specimens. The field work is including also in addition to the field observation, the photographing of the specimens in the field directly. The four study sites were conveniently selected based on vegetation cover and altitudes, transect walks were carried out with local people for collection of correct species with their original habitat. Collected data was also cross checked in different areas from local informants either by showing the plant specimen or telling local names to the informants Specimens were identified with the help of available literature (Al-Quran, 2005; 2007;2009).

Results

All results concerning the wild medicinal plant species are listed with full information mentioning scientific names; family; local names; parts used; method of administration (Table 1).

Discussion

Internal therapeutic effects of plants is too broad with some times contradictory concepts, beyond them many therapeutic

effects are categorized especially for intestinal colic, abdominal inflammation, hypoglycemic, haemostatic, remedy for dissolving the urinary stones, in hepatic and biliary diseases, as anti diarrhoeal, anti diabetic, cathartic, for gastric and intestinal ulceration, for amenorrhoea, as cardiac tonic, for fluid retention, for jaundice, as styptic, for spleen, gastric, hepatic and renal disorders, cholagogue, as anthelmintic, for heart attack, stopping bleeding of pulmonary and uterine origin, as antiepileptic, antitussive, emollient for intestinal mucosa, hypnotic, for urinary, bladder and kidney inflammations, anti dysenteric, antispasmodic, for biliary stones, anti diabetic, leucorrhoea and emmenagogue. In the present analysis, 42 plant species belonging to 22 families have been documented for their internal therapeutic uses. All of the investigated species were wild. The most commonly reported families were: Graminae, Liliaceae, Labiatae, Rosaceae, Compositae, Leguminosae and Umbelliferae. The plant parts used ranged from leaves (20), bulbs (2), whole plant (2), aerial parts (10), fruits (6), and vegetative parts (1). The method of administration falls into seven categories; paste, cream, juice (syrup), cooked as food, mixed with dairy products, pickled and decoction. The soaking in hot or warm water either for fresh or dried specimens.

Although this indigenous type of knowledge is well-known, but some plant species are still not known especially with regard to the internal therapeutic properties.

The therapeutic use of plant species reported with internal uses properties is rarely reported specifically as in this report. So, screening for active chemical constituents from these investigated wild medicinal plants is considered the major step towards establishing a good knowledge

base. Further more; testing their biological activities against infectious organisms is the ultimate need in order to establish scientific ground for searching new active compounds. Present investigation provides baseline information to screen out biological activities of these valuable plants in order to develop new analgesic and stimulant medicines from plant origin.

The mechanism of plant effect as analgesic and stimulant is varied among the plants, (1) some plants have showed activity against intestinal colic, intestinal ulceration and intestinal disorders like *Aaronsohnia factorovskyi* Warb. et Eig, *Achilleae tomentosa* L., *Cyperus longus* L., *Matricaria chamomilla* L., *Malva sylvestris* L. and *Pulicaria dysenterica* L.

(2) Some medicinal plants have used for hepatic disorders like *Chenopodium album* L. and *Linaria cymbalaria* Mill.

(3) Some medicinal plants are anti diabetic and hypoglycemic like *Artemisia herb-alba* L., *Sarcopoterium spinosa* (L.) Spach. and *Citrullus colocynthis* (L.) Sch.

(4) Some medicinal plants investigated used for abdominal inflammations, fluid retention, urinary and gastric disturbances and for jaundice like *Althaea rosea* (L.) Cav., *Ecballium elaterium* (L.) A. Rich., *Onopordum acanthium* L., *Oxalis corniculata* L., *Polygonum persicaria* L., *Teucrium polium* L. and *Spartium junceum* L.

(5) some medicinal plants have expectorant effect in amenorrhoea as emmenagogue, leucorrhoea as leucogogue, cholorrhoea as cholagogue like *Heliotropium europaeum* L., *Rubia tinctorum* L., *Sorbus aucuparia* L. and, *Desmostachya bipinnata* (L.) Stapf

(6) some medicinal plants have direct stimulation effect on heart as cardio tonic like *Digitalis purpurea* L., *Lallemantia iberica*

(M. B.) Fish, *Scilla autumnalis* L. and *Urginea maritima* Barker

(7) some plants are haemostatic, anti diarrhoeal, antiepileptic, anti dysenteric and stops bleeding of internal organs like *Capsella bursa-pastoris* L., *Arundo donax* L., *Chenopodium album* L., *Cistanche tubulosa* Schwi, *Ecballium elaterium* (L.) A. Rich., *Lamium amplexicaule* L., *Leontice leontopetalum* L. and *Senecio vernalis* L.

(8) some plants are used for renal calculi or stones, renal disorders, biliary stones, biliary disorders and bladder disorders like *Galium aparine* L. *Herniaria hirsuta* L., *Linaria cymbalaria* Mill., *Matricaria chamomilla* L., *Ononis spinosa* L., *Onopordum acanthium* L., *Plantago lanceolata* L. and *Sarcopoterium spinosa* (L.) Spach.

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Anexo**Table 1:** List of medicinal plants with respect to their classification names, part used, internal uses and administration

Plant no.	Plant species	Common name	Family	Part Used	Internal Uses	Administration
1.	<i>Aaronsohnia factorovskii</i> Warb. et Eig	Yellow chamomile	Compositae	Aerial parts	intestinal colic.	attention: some plant extracts must taken in very small dosages because of toxicity
2.	<i>Achillea tomentosa</i> L.	Milfoil	Compositae	Leaves	Intestinal colic	Fresh, soaked, cool and oral taken one time a day
3.	<i>Althaea rosea</i> (L.) Cav	Rose mallow	Malvaceae	Leaves and flowers	A b d o m i n a l inflammation,	Dried, soaked, cool and oral taken one time a day
4.	<i>Artemisia herb-alba</i> L.	Field southern wood	Compositae	Aerial parts	hypoglycemic	Fresh, soaked, cool and oral taken in the morning
5.	<i>Arundo donax</i> L.	Worm wood	Cyperaceae	Whole plant	Hypertensive	Fresh, soaked, cool and oral taken one time a day
6.	<i>Capsella bursa-pastoris</i> L.	Capweed	Cruciferae	Fruits	Haemostatic	Dried, soaked, taken as skin paste whenever needed
7.	<i>Centaurea solstitialis</i> L.	Centaury	Compositae	Aerial parts	Remedy for d i s o l v i n g urinary stones	Fresh, soaked, cool and oral taken one time a day
8.	<i>Chenopodium album</i> L.	Fat hen	Chenopodiaceae	Leaves	In hepatic and biliary diseases	Fresh, soaked, cool and oral taken one time a day
9.	<i>Cistanche tubulosa</i> Schwi	Broomrape	Orobanchaceae	Whole plant	Anti diarrhoeal	Fresh, soaked, cool and oral taken in the morning
10.	<i>Citrullus colocynthis</i> (L.) Sch.	Bitter apple	Cucurbitaceae	Seeds	Antidiabetic , cathartic	Dried, soaked, taken as skin paste whenever needed
11.	<i>Cyperus longus</i> L.	Adrupe	Cyperaceae	Vegetative parts	For gastric and intestinal ulceration	Fresh, soaked, cool and oral taken one time a day
12.	<i>Desmostachya bipinnata</i> (L.) Stapf.	Hulpa grass	Gramineae	fruits	In amenorrhoea and kidney diseases	Dried, soaked, taken as skin paste whenever needed

13.	<i>Digitalis purpurea</i> L.	Fox glove	Scrophulariaceae	Leaves	Cardiac tonic	Dried, soaked, oral taken whenever needed
14.	<i>Edallium elaterium</i> (L.) A. Rich.	cucumber	Cucurbitaceae	Fruits	For fluid retention, for jaundice	Fresh, soaked, cool and oral taken in the morning
15.	<i>Echinochloa crus-galli</i> (L.) P. Beauv.	Cock spur grass	Gramineae	Leaves and fruits	Styptic for spleen disorders	Fresh, soaked, cool and oral taken in the morning
16.	<i>Galium aparine</i> L.	Cliver	Rubiaceae	Aerial parts	Used for renal stones and calculi	Dried, soaked, taken as skin paste whenever needed
17.	<i>Geranium robertianum</i> L.	Cranesbill root	Geraniaceae	Leaves	Useful in renal diseases	Fresh, soaked, cool and oral taken whenever needed
18.	<i>Heliotropium europaeum</i> L.	Turnsole	Boraginaceae	Leaves	Cholagogue	Fresh, soaked, cool and oral taken whenever needed
19.	<i>Herniaria hirsuta</i> L.	Herinaria	Caryophyllaceae	Aerial parts	for bladder disorders	Fresh, soaked, cool and oral taken whenever needed
20.	<i>Inula viscosa</i> (L.) Ait.	Inula	Compositae	Aerial parts	Anthelmintic	Fresh, soaked, cool and oral taken whenever needed
21.	<i>Lallemantia iberica</i> (M. B.) Fish	Hemp nettle	Labiateae	Leaves	For heart attack.	Fresh, soaked, cool and oral taken whenever needed
22.	<i>Lamium amplexicaule</i> L.	Henbit	Labiateae	Leaves	Stops bleeding of pulmonary and uterine origin	Fresh, soaked, cool and oral taken whenever needed
23.	<i>Leontice leontopetalum</i> L.	Lion's foot	Berberidaceae	Leaves	Antiepileptic	Fresh, soaked, cool and oral taken whenever needed
24.	<i>Linaria cymbalaria</i> Mill.	Toadflax	Scrophulariaceae	Leaves	For hepatic disorder	Fresh, soaked, cool and oral taken whenever needed
25.	<i>Malva sylvestris</i> L.	Blue mallow	Malvaceae	Leaves	emollient for intestinal mucosa.	Fresh, soaked, cool and oral taken whenever needed
26.	<i>Matricaria chamomilla</i> L.	German camomile	Compositae	Aerial parts	For intestinal colic	Fresh, soaked, cool and oral taken whenever needed
27.	<i>Ononis spinosa</i> L.	G a m m o c k , restharrow	Leguminosae	Aerial parts	Useful for renal disorders	Dried, soaked, taken as skin paste whenever needed
28.	<i>Onopordum acanthium</i> L.	Scotch thistle	Compositae	Leaves	Antipyretic for gastric disorders.	Fresh, soaked, cool and oral taken whenever needed
29.	<i>Oxalis corniculata</i> L.	Indian sorrel	Oxalidaceae	Leaves	For urinary inflammations and treating burns.	Fresh, soaked, cool and oral taken whenever needed

30.	<i>Papaver rhoes</i> L.	Poppy	Papaveraceae	Leaves and latex	Antidiyenteric	Fresh, soaked, cool and oral taken whenever needed
31.	<i>Plantago lanceolata</i> L.	Ispaghula	Plantaginaceae	Leaves	for biliary stones.	Dried, soaked, taken as skin paste whenever needed
32.	<i>Polygonum persicaria</i> L.	Peachwort	Polygonaceae	Leaves	For treating gastric disturbances	Fresh, soaked, cool and oral taken whenever needed
33.	<i>Pulicaria dysenterica</i> L.	Flea bane	Compositae	Leaves	For intestinal colic	Fresh, soaked, cool and oral taken whenever needed
34.	<i>Rubia tinctorum</i> L.	Robbia	Rubiaceae	Fruits	Amenorrhoea	Dried, soaked, taken as skin paste whenever needed
35.	<i>Sarcopoterium spinosa</i> (L.) Spach.	Thorny burnet	Compositae	Whole plant	Useful in renal calculi	Fresh, soaked, cool and oral taken whenever needed
36.	<i>Scilla autumnalis</i> L.	Hyacinth	Liliaceae	Bulbs	Cardiac stimulant	Dried, soaked, taken as skin paste whenever needed
37.	<i>Senecio vernalis</i> L.	Ragwort	Compositae	Aerial parts	Stops bleeding	Fresh, soaked, cool and oral taken whenever needed
38.	<i>Spartium junceum</i> L.	Spanish broom	Leguminosae	Fruits	For bladder and kidney inflammations	Dried, soaked, taken as skin paste whenever needed
39.	<i>Sorbus aucuparia</i> L.	White beam, rowan	Rosaceae	Aerial parts	Leucorrhoea, emmenagogue	Fresh, soaked, cool and oral taken whenever needed
40.	<i>Taraxacum cyprium</i> H. Lindb	Taraxacum	Compositae	Leaves	Stimulates bile secretion	Fresh, soaked, cool and oral taken whenever needed
41.	<i>Teucrium polium</i> L.	Cat thyme	Labiatae	Leaves	Antidiarrhoeal - inflammatory for stomach and intestine	Fresh, soaked, cool and oral taken whenever needed
42.	<i>Urginea maritima</i> Barker	Squill white	Liliaceae	Bulbs	Cardiotonic	Dried, soaked, taken as skin paste whenever needed